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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) An apparatus for identifying a buried object using array-based ground penetrating radar having a control device, a plurality of transmit antennas, and a plurality of receive antennas, said control device receiving a transmit timing input signal and a receive timing input signal, said apparatus comprising:

a first delay circuit receiving the transmit timing input signal and generating a number of intermediate transmit timing signals delayed with respect to each other by a delay time;

transmit output switch circuit to select either the transmit timing input signal or a corresponding one of the intermediate transmit timing signals as a corresponding output transmit timing signal;

a second delay circuit receiving the receive timing input signal and generating a number of intermediate receive timing signals delayed with respect to each other by the delay time;

a shift-delay circuit coupled to the second delay circuit and the receive timing input signal to add the delay time to the intermediate receive timing signals; ~~and~~

receive output switch circuit to select either the receive timing input signal or a corresponding one of the intermediate receive timing signals as a corresponding output receive timing signal; and

a multistatic data acquisition controller.

2. (Original) The apparatus of claim 1, further comprising
an element to trigger one of the plurality of transmit antennas to transmit
dependent on the output transmit timing signal; and
an element to trigger one of the plurality of receive antennas to sample a
received waveform dependent on the output receive timing signal.
3. (Original) The apparatus of claim 2, further comprising a monostatic data
acquisition controller.
4. (Canceled)
5. (Original) The apparatus of claim 1, further comprising
a first comparator wherein the transmit timing input signal is derived by
comparing a common timing signal to a transmit threshold signal, and
a second comparator wherein the receive timing input signal is derived by
comparing the common timing signal to a receive threshold signal.
6. (Original) The apparatus of claim 1, wherein the first delay circuit comprises a
first plurality delay elements, the second delay circuit comprises a second plurality of
delay elements, and the shift-delay circuit comprises a shift-delay element.
7. (Original) The apparatus of claim 6, wherein all the delay elements are of the
same value.
8. (Original) The apparatus of claim 1, wherein the apparatus further comprises
a mobile housing for moving the apparatus along terrain under which the object is
buried.
9. (Original) The apparatus of claim 8, wherein the housing is suitable for being
hand-held by an operator.

10. (Currently amended) A method for identifying a buried object using array-based ground penetrating radar having a control device, a plurality of transmit antennas, and a plurality of receive antennas, said control device receiving a transmit timing input signal and a receive timing input signal, the method comprising:

generating a plurality of intermediate transmit timing signals by delaying the transmit timing input signal by a plurality of delay times;

selecting either the transmit timing input signal or a corresponding one of the intermediate transmit timing signals as a corresponding output transmit timing signal;

generating a number of intermediate receive timing signals by delaying the receive timing input signal by the plurality of delay times; and

selecting either the receive timing input signal or a corresponding one of the intermediate receive timing signals as a corresponding output receive timing signal; and
acquiring data with a multistatic data acquisition controller.

11. (Original) The method of claim 10, further comprising adding a second delay time to the intermediate receive timing signals.

12. (Original) The method of claim 10, further comprising
triggering one of the plurality of transmit antennas to transmit dependent on the output transmit timing signal; and

triggering one of the plurality of receive antennas to sample a received waveform dependent on the output receive timing signal.

13. (Original) The method of claim 12, further comprising acquiring data with a monostatic data acquisition controller.

14. (Canceled)

15. (Original) The method of claim 10, further comprising
comparing a common timing signal to a transmit threshold signal to derive the
transmit timing input signal; and

comparing the common timing signal to a receive threshold signal to derive the
receive timing input signal.

16-21. (Canceled)

22. (Currently amended) A control device for an impulse radar having a plurality
of transmit antennas and a plurality of receive antennas, said control device receiving a
transmit timing input signal and a receive timing input signal, comprising:

a first delay circuit receiving the transmit timing input signal and generating a
number of intermediate transmit timing signals delayed with respect to each other by a
delay time;

transmit output switch circuit to select either the transmit timing input signal or a
corresponding one of the intermediate transmit timing signals as a corresponding output
transmit timing signal;

a second delay circuit receiving the receive timing input signal and generating a
number of intermediate receive timing signals delayed with respect to each other by the
delay time;

a shift-delay circuit coupled to the second delay circuit and the receive timing
input signal to add the delay time to the intermediate receive timing signals; and

receive output switch circuit to select either the receive timing input signal or a
corresponding one of the intermediate receive timing signals as a corresponding output
receive timing signal; and

a multistatic data acquisition controller.

23. (Original) The control device of claim 22, further comprising
an element to trigger one of the plurality of transmit antennas to transmit
dependent on the output transmit timing signal; and

an element to trigger one of the plurality of receive antennas to sample a
received waveform dependent on the output receive timing signal.

24. (Original) The control device of claim 23, further comprising a monostatic
data acquisition controller.

25. (Canceled)

26. (Original) The control device of claim 22, further comprising
a first comparator wherein the transmit timing input signal is derived by
comparing a common timing signal to a transmit threshold signal, and

a second comparator wherein the receive timing input signal is derived by
comparing the common timing signal to a receive threshold signal.

27. (Original) The control device of claim 22, wherein the first delay circuit
comprises a first plurality delay elements, the second delay circuit comprises a second
plurality of delay elements, and the shift-delay circuit comprises a shift-delay element.

28. (Original) The control device of claim 27, wherein all the delay elements are
of the same value.

29. (Original) The control device of claim 22, wherein the control device further
comprises a mobile housing for moving the control device along terrain under which the
object is buried.

30. (Original) The control device of claim 29, wherein the housing is suitable for being hand-held by an operator.

31. (Currently amended) An apparatus for identifying a buried object using array-based ground penetrating radar having a control device, a plurality of transmit antennas, and a plurality of receive antennas, said control device receiving a transmit timing input signal and a receive timing input signal, the apparatus comprising:

means for generating a plurality of intermediate transmit timing signals by delaying the transmit timing input signal by a plurality of delay times;

means for selecting either the transmit timing input signal or a corresponding one of the intermediate transmit timing signals as a corresponding output transmit timing signal;

means for generating a number of intermediate receive timing signals by delaying the receive timing input signal by the plurality of delay times; ~~and~~

means for selecting either the receive timing input signal or a corresponding one of the intermediate receive timing signals as a corresponding output receive timing signal; and

means for acquiring data with a multistatic data acquisition controller.

32. (Original) The apparatus of claim 31, further comprising means for adding a second delay time to the intermediate receive timing signals.

33. (Original) The apparatus of claim 31, further comprising

means for triggering one of the plurality of transmit antennas to transmit dependent on the output transmit timing signal; and

means for triggering one of the plurality of receive antennas to sample a received waveform dependent on the output receive timing signal.

34. (Original) The apparatus of claim 33, further comprising means for acquiring data with a monostatic data acquisition controller.

35. (Canceled)

36. (Original) The apparatus of claim 31, further comprising
means for comparing a common timing signal to a transmit threshold signal to derive the transmit timing input signal; and

means for comparing the common timing signal to a receive threshold signal to derive the receive timing input signal.

37. (Original) The apparatus of claim 31, wherein the first delay circuit comprises a first plurality delay elements, the second delay circuit comprises a second plurality of delay elements, and the shift-delay circuit comprises a shift-delay element.

38. (Original) The apparatus of claim 37, wherein all the delay elements are of the same value.

39. (Original) The apparatus of claim 31, wherein the apparatus further comprises a mobile housing for moving the apparatus along terrain under which the object is buried.

40. (Original) The apparatus of claim 39, wherein the housing is suitable for being hand-held by an operator.